

United States Government

Department of Energy

memorandum

Office of River Protection

DATE: July 15, 2004

REPLY TO
ATTN OF: ORP:RJS 04-ORP-051

SUBJECT:

GOVERNMENT ACCOUNTABILITY OFFICE (GAO) REPORT, ABSENCE OF KEY
MANAGEMENT REFORMS ON HANFORD'S CLEANUP PROJECT ADDS TO
CHALLENGES OF ACHIEVING COST AND SCHEDULE GOALS JUNE 2004

TO: Jessie Hill Roberson, Assistant Secretary
for Environmental Management, EM-1, HQ

The U.S. Department of Energy (DOE), Office of River Protection's (ORP) review of the subject report indicates that the report contains generally factual information that is supportive of initiatives undertaken during this Administration by ORP and DOE Environmental Management (EM). ORP is in general concurrence with the basic findings of the subject report, namely that the Waste Treatment Plant (WTP) is a large complex project with associated schedule, cost, and performance risks. It is a project that is non-standard in nature relative to typical DOE practice and has been subject to changes in mission objectives with associated design revisions. Since contract initiation, WTP has evolved from a Phase I facility designed to design to treat only 10% of the tank waste in order to meet Fiscal Year 2018 interim Tri-Party Agreement (TPA) milestones to one that is capable of processing all high-level waste inventory from the underground storage tanks by 2028, enabling a 20 year acceleration of mission completion. We further concur that the project has escalated by approximately \$1.4 billion but remains on schedule for startup. GAO notes the substantial reductions in the schedule to complete the RPP mission and the life cycle cost, however, GAO's acknowledgement falls short of actually endorsing the revised schedule and cost profile.

However, we believe that the report and its readers would have benefited from a more balanced view of DOE's actions in the context of the evolution of this project and DOE's commitment to meet its TPA commitments while also accelerating the overall rate of risk reduction associated with the tank wastes. By ignoring the environmental and institutional constraints that this project is operating within, the report sets forth recommendations that, while appropriate for a new project with a clean design and regulatory slate, are not consistent with where this project was two years ago and must be within the next 24 years to meet regulatory commitments. GAO's academic approach could easily mislead readers and possibly impair DOE's ability to carry through on key commitments by diverting resources to the "form" GAO endorses rather than the "substance" of actual cleanup and treatment. We also address a few specific findings that we believe are not correct and should be revised. Our synopsis of the report and the relevance of its findings is set forth below.

1. GAO correctly acknowledges that DOE implemented contract performance reforms in the December 2000 procurement resulting in the current WTP contract. These include:
 - Selecting a project-appropriate contract type (i.e., cost reimbursement with incentive fees),
 - Competitively bidding the contract,
 - Linking contractor fees to cost and schedule performance, and
 - Further adjusting the contract's incentive structure to encourage the contractor to perform better when the contract was revised in 2003.
2. GAO acknowledged that although DOE did not implement its draft project management practices in its December 2000 WTP procurement, since 2002, ORP has implemented its project management practices in its WTP contract/project including:
 - A project acquisition strategy,
 - A contract price based on a 40% level of completion design,
 - A DOE-Headquarter reviewed, validated, and approved project baseline, and
 - Contingency funding that provides at least 80% confidence of meeting project cost objectives.
3. The GAO highlight that states, "An Absence of Key Management Reforms Challenges Achieving Cost and Schedule Goals", is significantly misleading. ORP has employed many of the specifications within DOE Order 413.3 and has determined that some others do not directly apply to the WTP design/build model. In those cases, ORP has employed equivalent methods that implement the spirit and intent of DOE O 413.3. During July, 2002 an Independent Review Team commissioned by EM-1 to review the WTP project submitted a report to the Secretary that included twenty recommendations to strengthen project management considering both DOE O 413.3 and the unique nature of the project. Shortly thereafter, ORP implemented all of those recommendations. Further, concurrent with modifying the WTP contract in April, 2003, ORP implemented a number of unique project management methods specifically designed to enhance cost and schedule control, including (but not limited to): zero baseline fee, shared cost savings formulation consistent with commercial practice but more aggressive than typical DOE guidelines, and joint Contractor and ORP management of the process to resolve trends that could lead to cost and/or schedule escalation. Consequently, we believe that GAO has not properly taken these factors into account and that its headline theme is incorrect and misleading.
4. The use of a design/build model (where both functions proceed in parallel), is relatively uncommon within DOE and the federal government overall; typically the government uses a sequential process of design first and then build. However, the design/build approach is considerably more common within private industry and has been proven successful for even large complex projects. This model is especially

- effective when the designer and builder is the same contractor, as is the case for WTP. It typically has an advantage in shortening project schedules, an advantage that is especially significant when the schedule savings results in a corresponding significant savings in both direct construction costs and other associated program costs. This is the case for the WTP. The choice of this approach, although non-traditional, is well grounded in logic and industry experience. The WTP contractor is the leading U.S. engineer and constructor and not only is well experienced with this model but also experienced in building major facilities for DOE, for example, the high-level waste vitrification facility at DOE's Savannah River site. Although GAO faults DOE for using what it calls a "fast-track" approach, GAO failed to offer any practical alternative solution(s) that would allow ORP to meet the TPA 2028 treatment completion milestone. We are continuing to methodically factor traditional project management approaches favored by GAO into the WTP project (see # 2/3).
5. GAO notes that there has been a 33% WTP project cost increase and that further increases may occur. GAO attributes those increases to initial cost estimates that were based on preliminary design information (less than 35% complete level of design). While the initial cost estimates were based on preliminary design information and the initially forecasted cost project estimated cost at completion has escalated ~\$1.4 billion (about 33% of original contract cost), it is also correct that most all of this escalation took place during the initial due diligence and early design period. The Independent Review Team determined in July, 2002 (at which time the design was ~15% complete) that the project Estimate at Completion was then in the \$5.6 -5.8 billion range, a value also confirmed by an independent CD-3 review shortly thereafter. In other words, the project estimated cost has not escalated at all during the past two calendar years, a period during which essentially all modifications to reconfigure the plant for mission acceleration have occurred. Further, GAO failed to acknowledge that the WTP project has performed far better regarding cost escalation than most other large capital construction projects recently reviewed by GAO both within DOE and elsewhere within the federal government. Moreover, during the time GAO was conducting its study ORP had already updated its cost estimates with the last contract modification in April 2003, which was based on a 40% level of completion, greater than the 35% level identified by GAO. The contractor's estimated cost to complete, when combined with cost saving initiatives, increased levels of design completion (the design is currently at approximately 60% complete), and project contingency, continue to add confidence of a successful WTP project outcome.
 6. GAO contends that DOE is depending on an unproven technology (bulk vitrification) to meet regulatory milestones on its assertion that the technology has not been fully tested on Hanford waste. We disagree and believe that GAO may not have taken into account tests we have had conducted with actual and surrogate tank wastes as well as other projects where the technology has been used with hazardous, radioactive, and mixed wastes domestically and internationally. Relative to Hanford tank waste, we have conducted laboratory tests on actual Hanford tank waste and full-scale tests on surrogate Hanford tank wastes. Over the coming year we will also conduct full-scale

- tests with actual Hanford tank waste. An assessment of supplemental technologies and alternatives to complete waste treatment by 2028 is in progress and will be submitted to the State of Washington Department of Ecology in accordance with the TPA by January 2005. We believe that the risks associated with considering bulk vitrification as a supplemental technology are substantially less than suggested by GAO.
7. GAO faults ORP for not developing an alternative ion exchange resin for the WTP, raising concerns regarding a single-source provider, high unit costs, and supply risks and claims that ORP has missed an opportunity to save \$50 million. We disagree that an opportunity has been missed to save \$50 million and would point out that we have already saved \$20 to \$29 billion (current dollar life cycle cost) through initiatives that preceded the resin in the priority rankings. ORP does agree, however, that an alternative resin may provide an additional opportunity to reduce costs and project risk and has already taken steps to develop such an alternative. To date, that alternative resin has successfully passed the first phase of a three-phase qualification campaign, can be produced by multiple major vendors, and should be available at ~10% of what the current baseline resin costs. Although the qualification schedule is aggressive, we are optimistic that the qualification tests can be completed in time to use the alternative resin in the initial WTP runs. If qualification is not complete by the time the initial resins must be ordered, the alternative resin would still be available when replacement resins are needed, thereby reducing life cycle costs.
 8. GAO contends that DOE (complex wide) has not adequately assessed or mitigated the legal challenge to its high-level waste treatment strategy. While GAO contends that DOE has not evaluated the full suite of possible scenarios and that some potential outcomes may exceed downside costs projected by EM, our draft Tank Closure Environmental Impact Statement (EIS) will evaluate the environmental impacts and will estimate costs associated with a very wide range of alternatives including those associated with unfavorable litigation and legislation outcomes. The draft EIS is scheduled to be issued for public comment in October 2004. While GAO recommends that DOE “develop and disclose to Congress a full and complete estimate of the costs and time frames required to dispose of Hanford’s and the rest of DOE’s high-level tank wastes...in a high-level waste repository”, we fully support Jessie Roberson’s position on this issue as described in Appendix III of the GAO report. Creating a detailed plan to address each of the possible outcomes makes little sense at this point in time as the plan would likely be overtaken by litigation or legislative events before it could be fully developed and would, therefore, make poor use of taxpayer dollars.
 9. The GAO believes our \$20 billion cost savings estimate resulting from accelerating the project is overstated. The GAO contends that life cycle savings should be determined by using present-value analysis (which discounts future costs) rather than comparing old and new validated baselines in current dollars (which are based on estimated funding requests and account for inflation). As GAO noted in its report, DOE disagreed with using a present-value technique for identifying baseline cost savings. We recognize the utility of present value methods for comparing alternate investments when different expenditures are far apart in time and, in fact, provided

GAO with a report where we used present-value and uncertainty analyses to evaluate alternative low-activity waste treatment approaches. Relative to the projected cost savings, however, we were not analyzing the time-value of money but, rather, comparing the projected funding that would be required under the old and new baselines, i.e., the dollars Congress would need to appropriate in order to meet those baselines. Our reporting of projected cost savings is based on the past and present established baselines for the project. Those projections appropriately include inflation rates that were used in the validated baselines. Regardless, however, of which savings projection one chooses to accept - \$12 or \$20 billion – either one constitutes a significant savings to the American taxpayer.

It is DOE policy and best management practice to establish a baseline and then manage to that baseline. The baseline is established and provided to Congress, regulators, and stakeholders. The baseline represents the best estimate of the actual costs that will be incurred by the project and tells Congress as well as regulators and stakeholders the funding needed in each year of the project. Whenever a change is made to a project, the change to the baseline (either positive or negative) must be reported and justified. Accordingly, the River Protection Project life cycle cost savings are based on the difference between the current and the previous baseline. There is a \$29 billion difference in the project baseline – the actual dollar amounts that Congress would need to appropriate in order to complete the project – between the current baseline and the previous baseline. Nonetheless, we found it interesting that GAO's present value analysis estimated "cost savings" of 41-52% (\$12 billion out of \$23-29 billion total present value cost), while we had conservatively reported a life-cycle cost saving of 36% (\$20 billion out of the \$56 billion total project cost). In other words, the present-value method estimates a greater percentage than the savings that DOE had claimed.

10. With regard to the WTP functional and mission capabilities, while GAO has correctly quoted a number of statistics and related facts regarding WTP capabilities and changing mission objectives, the report does not convey a clear and meaningful picture. The initial plant, as contracted for in FY 2000, was intended to have a waste pretreatment capability sufficient to treat the entire waste tank inventory, an objective which has never changed over the project lifetime. This is of particular significance since pretreatment is the largest and most expensive component of WTP. The high-level waste melter facility was intentionally sized greater than its initial (Phase I) production objective such that the facility could accept larger melters when production ramped up during Phase II. The pumps, pipes, tanks, room dimensions, etc. were sized for Phase II production rates. However, the two-phase project concept was not capable of meeting the 2028 treatment completion date specified in the TPA without substantial new facilities at a very high capital cost that would only operate for a small fraction of their design life.

ORP, therefore, redesigned its mission approach to make optimum use of the WTP facilities already under contract by obtaining maximum throughput from those facilities at the outset of treatment rather than waiting for Phase II. Accordingly, the

WTP was reconfigured to add more high-level waste melter capacity such that all high-level waste could be treated by 2028 without the need for any additional Phase II facilities. This change was accomplished without any project cost escalation or schedule slippage. ORP also looked more closely at the characteristics of the waste in its tanks and determined that (a) some waste did not appear to have resulted from the reprocessing of spent nuclear fuel based upon operating records and would, therefore, be more appropriately addressed as transuranic waste, and (b) some low-activity waste appeared to be suitable for treatment by methods other than vitrification in the WTP, e.g., bulk vitrification or possibly steam reforming, both of which appear to produce waste forms that would meet on-site performance requirements for disposal but at a lower cost than would result from building additional WTP low-activity waste treatment facilities.

As a result of these paradigm shifts in its strategic approach to waste treatment, ORP is now well positioned to accelerate risk reduction, meet its regulatory commitments, and complete its mission in less time and at lower cost than was previously thought possible.

Overall, we were pleased with the factual information and level of scrutiny provided in the GAO report and commend GAO for its effort. We agree with GAO's recommendations to implement DOE Order 413.1 and are in fact doing so. However, we believe that the RPP *status quo* is significantly better than portrayed in the GAO report.

As a final note, we will be installing the feed tanks in the pretreatment building, which is a significant WTP milestone. If your schedule allows, we would be pleased if you or your representative could join us for this milestone, which is scheduled to occur during the second week of August.

If you have any questions, you may contact me at (509) 438 0436.

Original Signed by Roy and Faxed

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